

REMARKS

Claims 1-15 are pending in this application. By this Amendment, claims 1, 6 and 11 are amended to emphasize certain features of the claims. No new matter is added.

Reconsideration of the application is respectfully requested.

Applicant appreciates the courtesies extended to Applicant's representative by Examiners' Shapiro and Awad during the October 26, 2005 personal interview. Applicant's separate record of the substance of the interview is incorporated into the following remarks.

I. Allowable Subject Matter

Applicant gratefully acknowledges that the Office Action indicates that claims 2, 3, 7 and 8 include allowable subject matter.

II. Rejections Under 35 U.S.C. §103(a)

The Office Action rejects claims 1, 4, 6, 9, 11 and 15 under 35 U.S.C. §103(a) over U.S. Patent No. 5,867,140 to Rader in view of U.S. Patent No. 6,663,272 to Kumagawa et al. (Kumagawa), U.S. Patent No. 5,861,863 to Kudo et al. (Kudo) and U.S. Patent No. 6,545,653 to Takahara et al. (Takahara); rejects claims 5 and 10 under 35 U.S.C. §103(a) over Rader, Kumagawa, Kudo, Takahara and U.S. Patent No. 6,181,313 to Yokota et al. (Yokota); and rejects claims 12-14 under 35 U.S.C. §103(a) over Rader, Kumagawa, Kudo, Takahara and U.S. Patent No. 6,512,506 to Shimada. Applicant respectfully traverses the rejections.

Neither Rader, Kumagawa, Kudo nor Takahara, alone or in combination, teach or suggest a driving method of a display device, a driving circuit of a display device, and a display device for driving pixels including selecting a scanning line among the particular scanning lines every horizontal scanning period with a selection voltage supplied to the selected scanning line for one of two split halves of the one horizontal scanning period and with a non-selection voltage supplied to the selected scanning line for another of two split halves of the one horizontal scanning period; the polarity of the selection voltage being

inverted every two or more horizontal scanning periods; supplying each of the scanning lines other than the particular scanning lines with a non-selection voltage which is inverted in polarity with respect to the intermediate value every one or more vertical scanning periods; the particular data line being supplied with the on-display voltage and the off-display voltage for substantially equal periods within the one horizontal scanning period for the selected scanning line; supplying the data line other than the particular data lines with the off-display voltage or the on-display voltage for a period during which the particular scanning lines are consecutively selected; and the polarity of the off-display voltage is inverted in synchronization with the period of polarity inversion of the selection voltage, as set forth in independent claim 1 and similarly set forth in independent claims 6 and 11.

A. Rader

During the personal interview, Applicant's representative asserted that Rader teaches, in Fig. 3, a display system 300 which is capable of switching between a partial display mode and a full display mode, wherein the partial display mode provides power savings over the full display mode. The display system 300 includes a display panel 200 having a full display screen area 303 and a partial display field 305. See Fig. 3, col. 2, lines 21-30, and col. 6, lines 15-18. In a full display mode, an input switch 414 connects an input contact 426 with an output contact 430 to deliver pixel signals. See Fig. 4, and col. 6, lines 30-35. In a partial display mode, the input switch 414 connects an input contact 428 with output contact 430 so that the output of FIFO memory 416 which stores all of the pixel control signals for the partial image is re-circulated. See Fig. 4, col. 7, lines 8-10, and col. 5, lines 19-27. This allows the contents of the FIFO memory 416 to re-circulate while a DMA channel 406 and, optionally, a display image buffer 304 are disabled/powered down. See col. 5, lines 21-24.

However, Rader does not even mention supplying a selection voltage, a non-selection voltage, an on-display voltage, and an off-display voltage during certain periods with respect

to a horizontal scanning period, as set forth in claims 1, 6 and 11. Further, Rader does not even mention the combination of inverting a polarity of the selection voltage supplied to the data line every two or more horizontal scanning periods, non-selection voltage and off-display voltage during certain periods with respect to a horizontal scanning period and a vertical scanning period, as set forth in claims 1, 6 and 11.

In the driving method of a display device, the driving circuit of a display device, and the display device for driving pixels respectively recited in claims 1, 6 and 11, a scanning line may be selected with a selection voltage for one split half of one horizontal scanning period and a non-selection voltage for the other split half. For example, in the exemplary embodiment disclosed in Fig. 7, a selected scanning line 312 may be supplied with the scanning signal Y1 containing the selection voltage +VS when the selected scanning line falls within the display area and a non-selection voltage -VD/2 when the selected scanning line falls within the non-display area. The polarity of the scanning signal Y1 may be inverted every one or more vertical scanning periods (frames). See paragraphs [0071] and [0072] of the present specification.

Also, for the duration during which the scanning line falls within the selected display area, the polarity inversion period of the selection voltage +VS may be set to two or more horizontal scanning periods. For example, in Fig. 7, the polarity +VS of the scanning signal Y1 in the first horizontal scanning period 1H may be inverted to polarity -VS of the scanning signal Y3 in the 3rd horizontal scanning period.

In the exemplary embodiment disclosed, the data signal supplied to the data line within the non-display area may be fixed to a voltage corresponding to an off display throughout one horizontal scanning period to reduce the voltage switching frequency of the data signal for the non-display area. See paragraph [0057] of the present specification. Also, for the duration during which the scanning line falling within non-display area is selected, the

polarity of the data signal for the data line within the non-display area may be switched for a predetermined period so the power consumed by the pixels within the non-display area is reduced. See paragraph [0057] of the present specification. Rader does not teach or suggest the features or provide the advantages of claims 1, 6 and 11 as discussed above.

The Office Action admits that Rader does not teach or suggest a selection voltage, an on-display voltage, and off-display voltage, and a plurality of the selection voltage, and a plurality of the off-display voltage being supplied/inverted during the period set forth in claims 1, 6 and 11. However, the Office Action asserts that Kumagawa, Kudo, Takahara and Shimada remedy the deficiencies of Rader. Specifically, the Office Action asserts that Kumagawa teaches supplying lighting and non-lighting voltages and different polarity voltages during certain periods with respect to a horizontal scanning period. See Figs. 25-26, and col. 34, line 63 - col. 35, line 6. However, neither Kumagawa, Kudo, Takahara nor Shimada remedies the deficiencies of Rader.

B. Rader In View Of Other Related Art

During the personal interview, Applicant's representative asserted that Kumagawa teaches, in Figs. 25-26, a half-wave rectifier that rectifies voltages and supplies the voltages at various times during a horizontal period 'th' to a bus line 202. See col. 34, lines 62 - col. 35, line 6. Kumagawa indicates that the voltage level is switched using an external switch in Fig. 25 or by an inverter circuit in the drive IC in Fig. 26. See col. 34, lines 64-66. Although Kumagawa arguably teaches that the voltage level is switched with respect to one horizontal scanning 'th', Kumagawa does not teach or suggest "the polarity of the selection voltage being inverted every two or more horizontal scanning periods," as recited in claim 1, and similarly set forth in claims 6 and 11.

During the personal interview, the Examiners asserted that prior art Fig. 26 of the present specification appears to teach "selecting a scanning line among the particular scanning

lines every horizontal scanning period with a selection voltage supplied to the selected scanning line for one of two split halves of the one horizontal scanning period and with a non-selection voltage supplied to the selected scanning line for another of two split halves of the one horizontal scanning period." Therefore, the Examiners asserted that Fig. 26 may be combined with Rader. However, the Examiners indicated that further review will be required in light of our arguments.

Further, the Examiners acknowledged that neither Rader, Kumagawa, Kudo, Takahara nor Shimada, alone or in combination, appear to teach or suggest "the polarity of the selection voltage being inverted every two or more horizontal scanning periods." However, the Examiners indicated that further review and an updated search for other related art will be required.

For at least the reasons discussed above, Applicant respectfully submits that claims 1, 6 and 11 would not have been rendered obvious by Rader, Kumagawa, Kudo, Takahara and Shimada, alone or in permissible combination. Claims 2-5, 7-10 and 12-14 variously depend from claims 1, 6 and 11, and thus also would also not have been rendered obvious by Rader, Kumagawa, Kudo, Takahara and Shimada, alone or in permissible combination, for at least the reason set forth above, as well as for the additional features they recite. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-15 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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